

Pedicled myocutaneous trapezius flap for chronic osteomyelitis of the spinous processes – a case report

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Summary

Complex injuries to the posterior trunk can still pose a significant challenge to the reconstructive surgeon. Due to the lack of skin laxity, dependent anatomical location and the importance of the deeper structures, a systematic approach tailored to the individual defect should be considered for these types of reconstructions. In our case report, we present a reconstructive solution of a chronic defect of the back caused by resection of an ulceration. What was previously considered to be a relapse of a malignant melanoma turned out to be a chronic osteomyelitis of the spinous processes of the thoracic vertebrae. The defect after the resection of the ulceration and infected spinous processes of the thoracic vertebrae with exposed dorsal lamina was covered with pedicled myocutaneous flap. Reconstruction yielded well-vascularized tissue that provided sufficient volume and tissue quality. Even in the light of modern perforator flaps, local or locoregional muscle and myocutaneous flaps remain the first choice for the treatment of deep back defects. Considering all the factors in the given case, plastic surgeons are able to tailor the reconstructive technique to every individual case to match the desired reconstruction goal.

Key words

osteomyelitis – defect – pedicled – myocutaneous – trapezius flap – back reconstruction

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Introduction

Posterior trunk wounds can result from trauma, tumor ablation, chronic pressure, congenital defects, repeated surgeries, or radiation therapy [1,2]. Covering back wounds becomes even more critical when osteosynthetic material or bone is exposed. Given the lack of laxity of the skin, dependent anatomical location and importance of the deeper structures, an individual plan and strategy should be considered in these types of reconstructions. Considering all the aspects of a given defect such as size, depth, structure, localization in the anatomical region of the back, osteosynthetic material or bone exposure, contamination, etc., the optimal reconstructive strategy must be considered. Furthermore, predisposing factors such as infection, cerebrospinal fluid leakage,

smoking, diabetes mellitus, history of radiation therapy, osteosynthetic material exposure and others influence the outcome of the reconstruction in high-risk patients [2].

Description of the case

A 75-year-old male was referred to our department by an oncologist. The patient presented with a large ulceration on his back. He had a malignant melanoma removal in the same location 40 years ago. The defect after the previous excision was covered by a fasciocutaneous random-pattern transposition flap. The ulceration was about 5 × 5 cm large, odorous, surrounded by scar tissue from the previous surgery. The oncologist requested excision of the ulceration and histological examination with suspicion of malignant melanoma recurrence. Staging exami-

nation showed no nodal disease or metastases. Perioperatively, after resection of the tumor, we discovered suspicious whitish, fish-meat like tissue at the base of the tumor infiltrating the paraspinous muscles and probably even the bone. Unsure of the extent and origin, we temporarily covered the defect by vacuum-assisted closure (VAC) and waited for histological findings. Histologic findings showed no malignancy in all the specimens. MRI was performed to rule out osteomyelitis of the vertebrae and communication with the spinal canal. The wound was complicated by an infection caused by *Staphylococcus aureus*, which required subsequent necrectomies, VAC therapy and antibiotic treatment. After eliminating the infection, the defect was covered by a split thickness meshed skin graft and the patient was discharged to outpatient

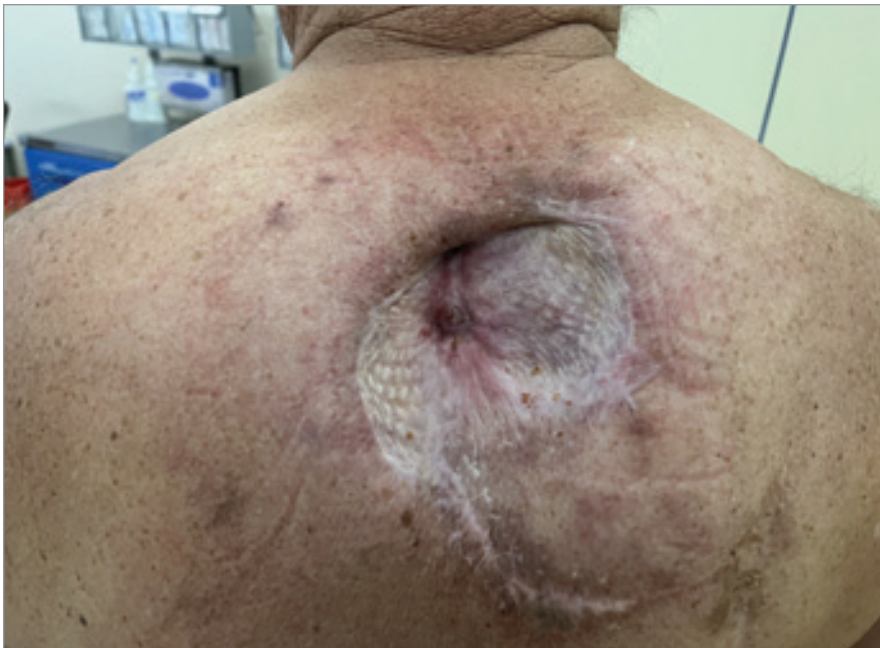


Fig. 1. Chronic defect of the back with central fistulas, surrounded by healed split thickness skin graft and scars from previous surgery.



Fig. 2. Flap elevation and pedicle dissection with the defect on the right.

care. Healing was complicated by poor take of the skin graft above the vertebrae. The defect remained resistant to all conservative treatments and furthermore progressed into fistulas and osteomyelitis of the spinous processes of the thoracic vertebrae proved by imaging (Fig. 1). We approached this chronic defect by radical resection of the fistulas leading to the spinous processes and, together with the neurosurgeon, resected the spinous processes of two thoracic vertebrae *en bloc*. The created deep defect with exposed dorsal lamina at the bottom was covered by pedicled myocutaneous trapezius flap. The flap was risen via incising the designed skin island with the trapezius muscle attached according to the preoperative markings. Following and further dissecting the pedicle cranially towards the origin of the dorsal scapular artery between the rhomboid muscles, we were able to free the flap sufficiently (Fig. 2). We then transposed the flap through a subcutaneous tunnel connecting the donor site and primary defect to cover the defect with sufficiently bulky tissue without tension. This flap design brought effective, multilayer coverage of the defect with highly vascularized tissue. The donor site of the flap was closed primarily in a layered fashion while using Baroudi sutures to aid and reduce the tension on skin closure. Healing was by primary intention without any surgical complications. Postoperative care included flap monitoring, antibiotic treatment, deep vein thrombosis prophylaxis and physical therapy. Drains were removed on the 3rd and 8th days after surgery. Two weeks after the surgery, the skin stitches were removed, and donor site seroma was punctured. Seroma of the donor site required three more punctures with no need for revision surgery. We were able to reach a sufficient and good quality coverage of the defect with a well-vascularized tissue. There was no sign of osteomyelitis recurrence at a 3-month follow-up, no subjective complaints were noted, and healing was satisfactory.

Donor site morbidity was acceptable (Fig. 3).

Discussion

Appropriate flap selection minimizes patient morbidity while maximizing functionality. Precise reconstructive plan including multidisciplinary approach with neurosurgery and/or orthopedic surgery is recommended [1]. As a result of the above, secondary healing or skin grafting are often not the optimal solution, especially for complex, deep posterior trunk defects. [1]. The use of muscle and myocutaneous flaps can provide solution for such complex reconstructive challenges, bringing robust, well-vascularized tissues to the defect [1,2]. Flaps based on the latissimus dorsi, trapezius and paraspinal muscles are considered the traditional first-line options [1]. With advancing knowledge of the vascular anatomy of the perforator flaps providing a muscle sparing reconstruction, reliable healing, better cosmesis and improved morbidity of the donor site, these flaps are starting to come forward as a good option for such reconstructions. Lower trapezius myocutaneous flap, first described by Baek et al. and Mathes and Nahai in 1980, has been a standard pedicled flap in head and neck reconstruction [3]. While the vascular anatomy of the flap might be complicated, the most surgically important parts are the transverse (middle) part and the ascending (lower) part of the muscle. The transverse part of the muscle is supplied by the superficial cervical artery and is considered an upper trapezius flap. The descending part of the muscle is supplied by the dorsal scapular artery (DSA) and is considered as a lower trapezius flap [3,5]. There are two typical indications for the lower trapezius flap: first, soft tissue defects of the posterior neck up to the occipital region, and second, defects over the cervical and thoracic spine [3]. The design of the flap is most often myocutaneous with vertical or oblique skin island. The dissection starts with an incision of the skin is-



Fig. 3. Healed flap and donor site at three months follow-up.

land and elevation of the muscle [3]. Care should be taken when harvesting the trapezial flap, as aggressive muscle harvest or nerve injury can result in winging of the scapula [1]. In most cases, the donor site can be closed primarily.

Conclusion

The pedicled myocutaneous trapezius flap based on the DSA is a well-established procedure and can be strongly recommended for a variety of defects, especially of the posterior trunk and neck region, due to the short duration of surgery and low donor site morbidity [3].

An effective reconstructive strategy to manage soft tissue defects and wounds of the spinal region is to recognize high-risk situations for potential wound-healing problems and then provide quality soft tissue coverage so that potentially serious and difficult wound complications can be avoided [4].

In our case, using a pedicled lower trapezius myocutaneous flap to reconstruct a deep, midline defect with exposed bone proved as a reliable, stable, and well-designed reconstruction.

Roles of authors

Petr Vodička – author, article compositor and surgeon;
Vladimír Mařík – article supplementation and consultation.

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References

1. Song DH., Hong JP., Neligan PC. Reconstruction of the posterior trunk: volume 4: trunk and lower extremity. In: *Plastic Surgery. Elsevier Health Sciences*. 2023: 354–387.
2. Chieng LO., Hubbard Z., Salgado CJ., et al. Reconstruction of open wounds as a complication of spinal surgery with flaps: a systematic review. *Neurosurg Focus*. 2015, 39(4): E17.
3. Wei FC., Mardini S. Trapezius flap. In: *Flaps Reconstr Surg. Saunders*. 2016: e134–e156.
4. Chang DW., Friel MT., Youssef AA. Reconstructive strategies in soft tissue reconstruction after resection of spinal neoplasms. *Spine*. 2007, 32(10): 1101–1106.
5. Yang D., Morris SF. Trapezius muscle: anatomic basis for flap design. *Ann Plast Surg*. 1998, 41(1): 52–57.

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